Tomography under unknown angles

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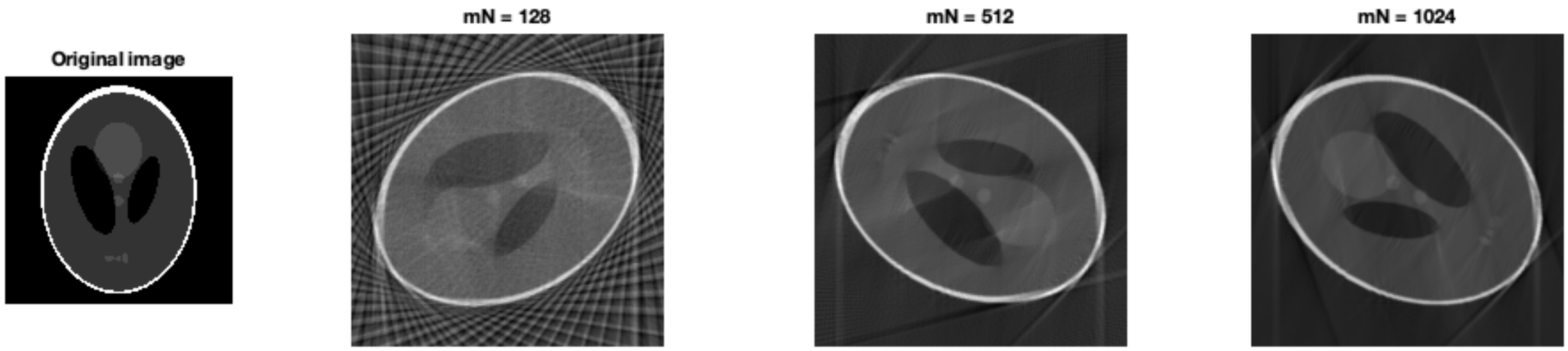
- Graph Laplacians
- SLLE - different weight measurements
- Nearest Neighbour - without dimensionality reduction
- Unknown Shifts - with/without noise

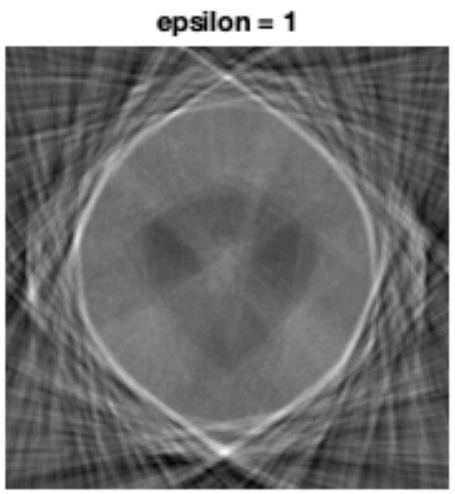
Variation with number of angles

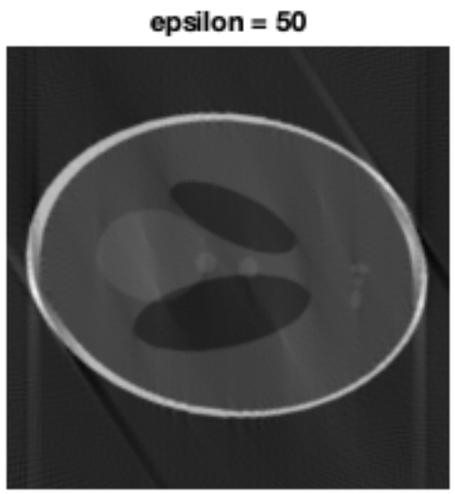


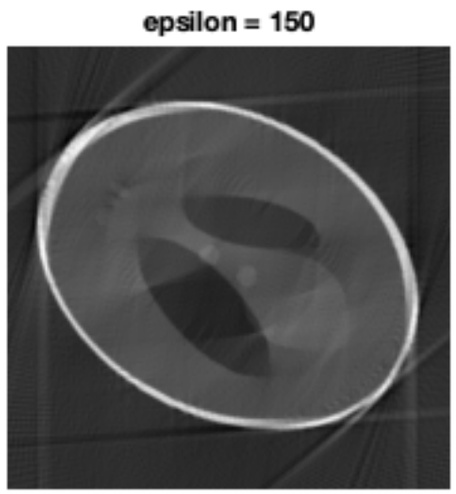
mN = projection angles, N = reconstruction angles, m = redundancy factor

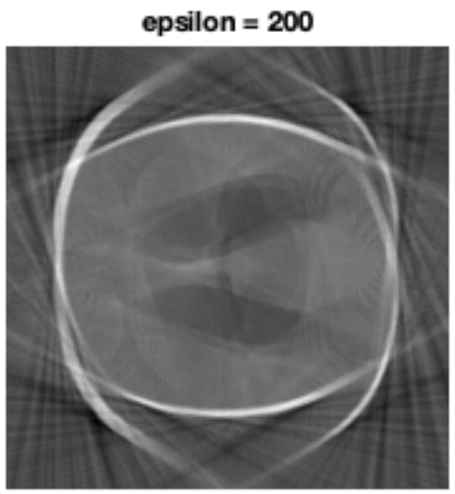
Better reconstruction with more angles

Variation with epsilon



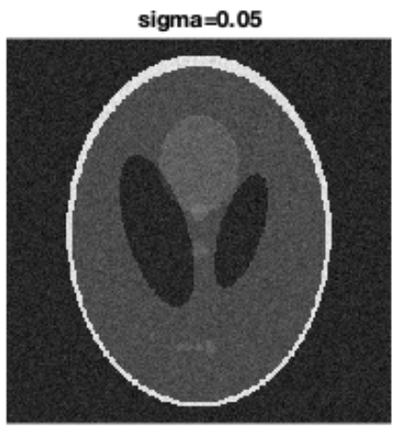


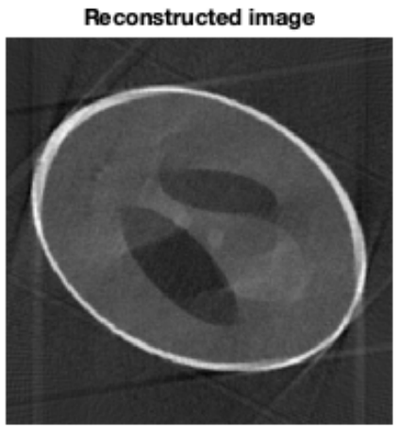


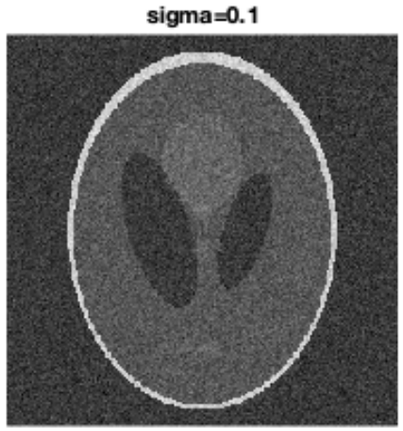


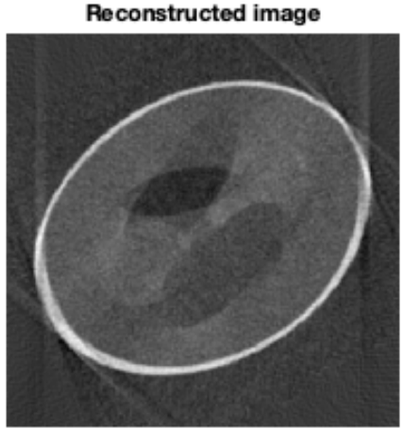
$$W_{ij} = k\left(\frac{\|\boldsymbol{x}_i - \boldsymbol{x}_j\|^2}{2\varepsilon}\right), \quad i,j = 1,\ldots,N$$

Variation with noise level

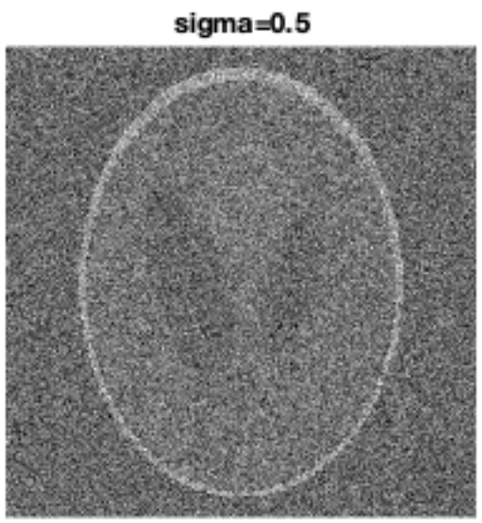


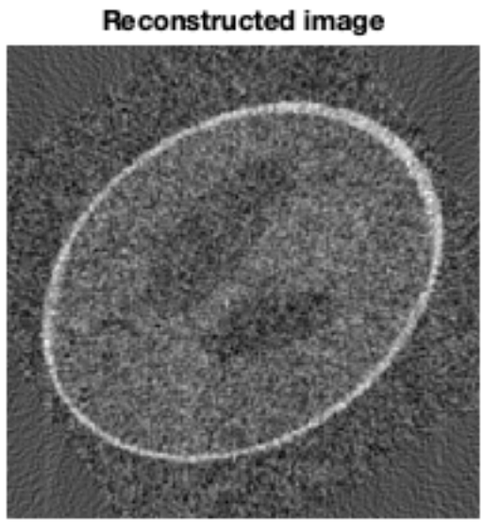




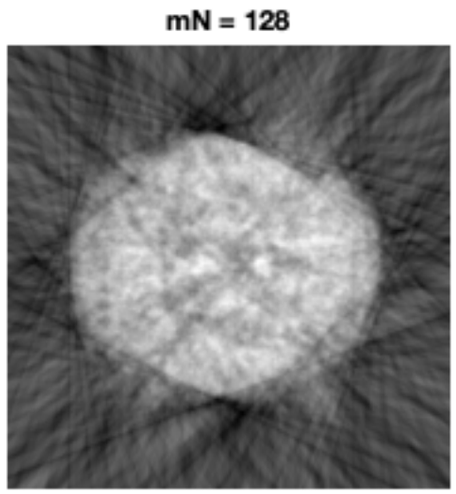


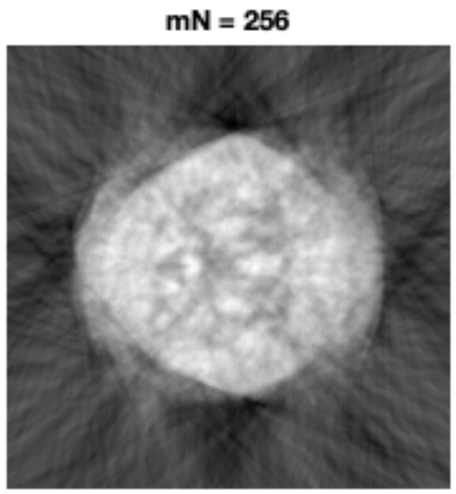
Able to reconstruct with large noise

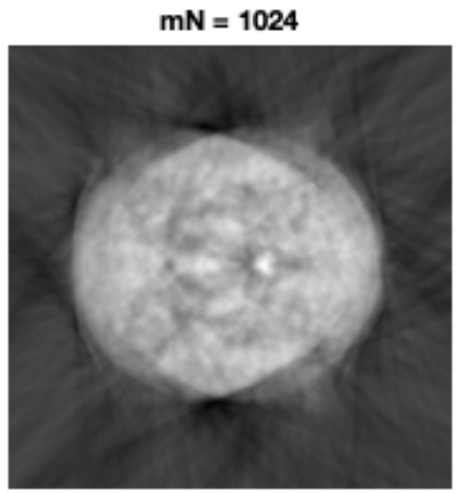




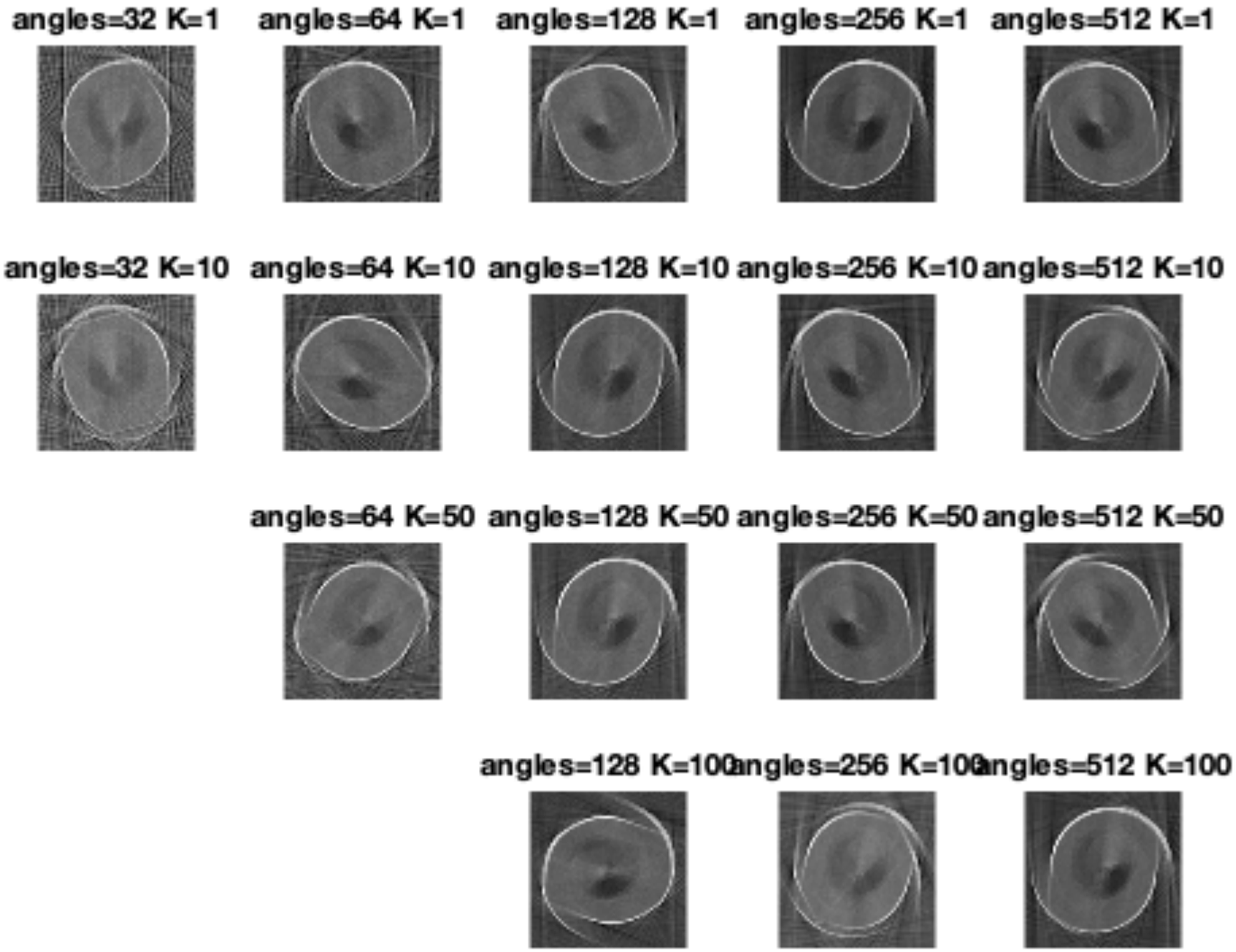
Testing on Brain image



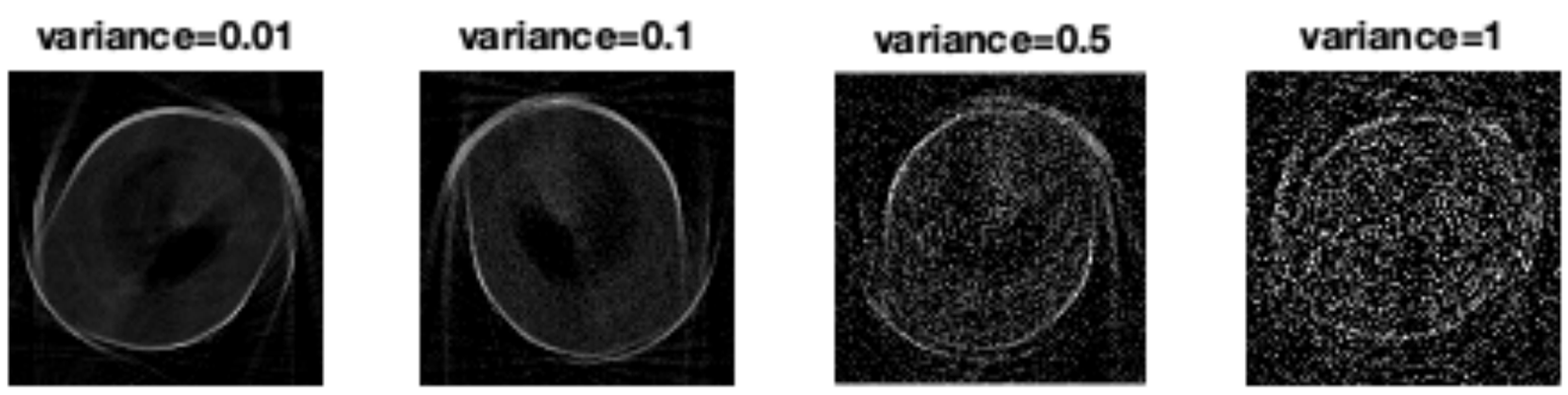




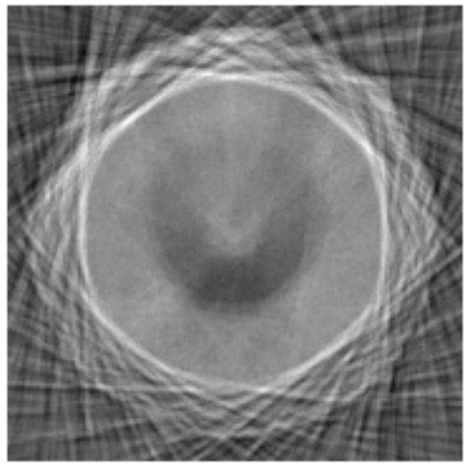
Variation with K and Angles



Variation with noise



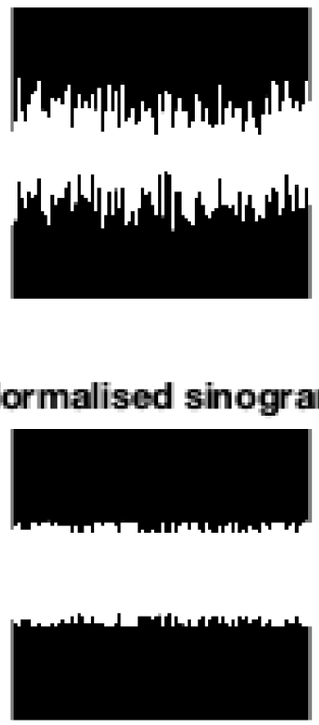
Ordering based approach



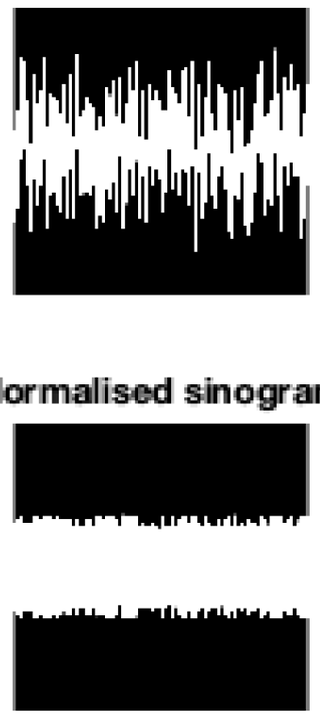
Unknown shifts

Sinogram with random shifts per angle for some range

Normalised sinogram

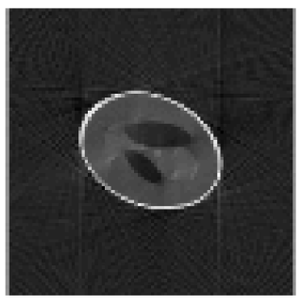


Normalised sinogram

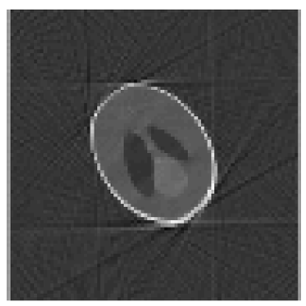


Normalised sinogram

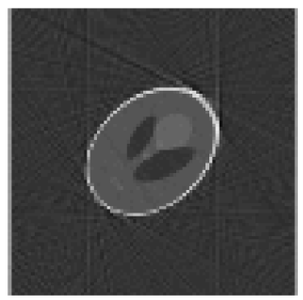
range = 10



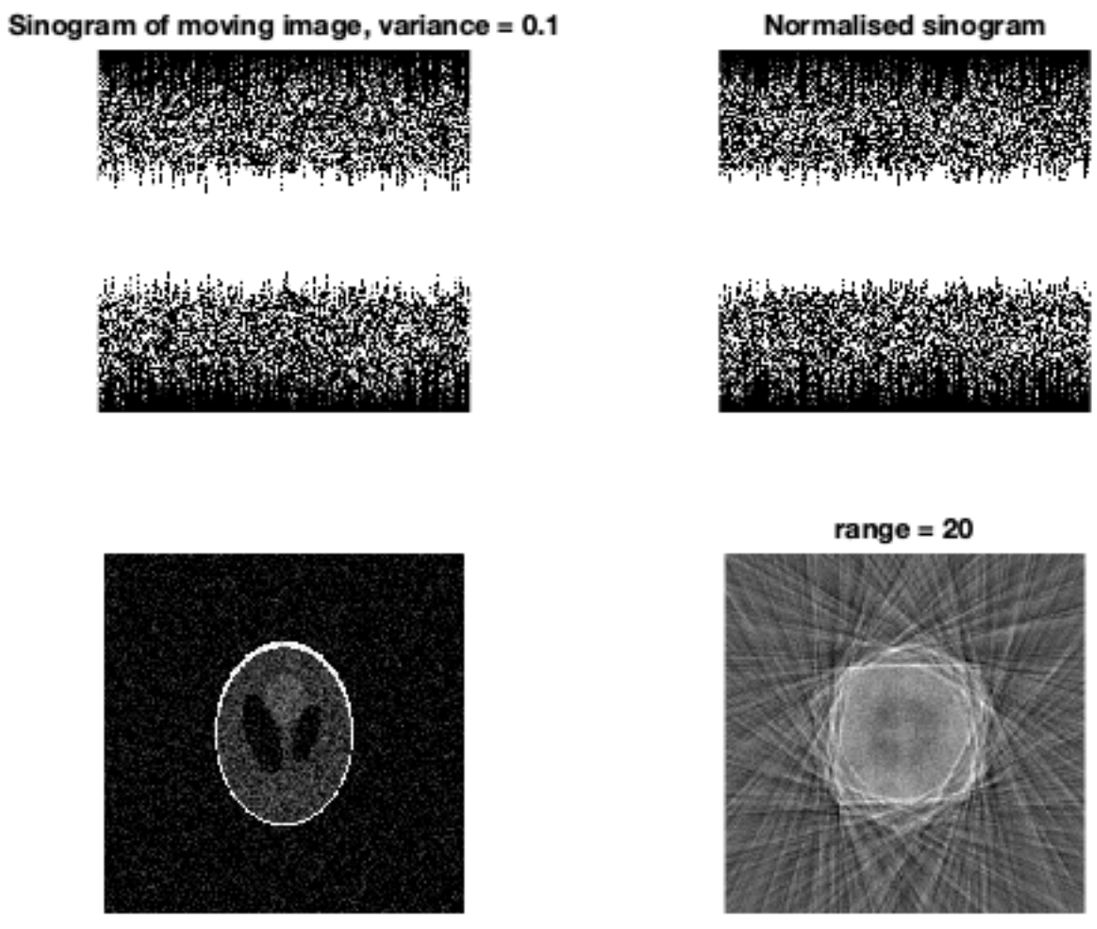
range = 50



range = 100



Under noise



Reduce noise in projections
Patch based PCA on every projection